

What is Claimed is:

1. A method for preventing infection of target cells by human immunodeficiency virus type 1 ("HIV-1") comprising exposing target cells to an infection preventing amount of a synergistic combination of at least one attachment inhibitor and at least one fusion inhibitor.
2. The method of claim 1 wherein the attachment inhibitor is a polypeptide selected from the group consisting of polypeptides that bind to the CD4 receptor on target cells and inhibit or prevent HIV-1 from attaching to the target cell, polypeptides that bind to the CD4 receptor on target cells and permit HIV-1 to attach to the target cell but inhibit or prevent cellular fusion between HIV-1 and the target cell, polypeptides that bind to gp120 on HIV-1 and inhibit or prevent HIV-1 from attaching to the target cells, and polypeptides that bind to gp120 on HIV-1 and permit HIV-1 to attach to the target cell but inhibit or prevent cellular fusion between HIV-1 and the target cell and the fusion inhibitor is selected from the group consisting of polypeptides that interact with gp41 to inhibit or prevent its harpoon-like attachment to target cells and polypeptides that interact with gp41 to inhibit or prevent its recoil-like action that brings HIV-1 into close contact with target cells.
3. The method of claim 2 wherein the attachment inhibitor is selected from the group consisting of antibodies, antibody fragments, CD4 antagonists comprising a fragment of a CD4 ligand, and gp120 antagonists comprising a fragment of CD4 and the fusion inhibitor is selected from the group consisting of anti-gp41 antibodies and polypeptides having from 30 to 50 amino acids and the ability to interact with gp41 to prevent its harpoon-like or recoil-like action.
4. The method of claim 3 wherein the attachment inhibitor is selected from the group consisting of anti-CD4 antibodies and anti-gp120 antibodies and the fusion inhibitor is selected from the group consisting of T-1249, T-649, 5-Helix, pentafuside, and their functionally equivalent peptides.
5. The method of claim 2 wherein the attachment inhibitor is an anti-CD4 antibody that permits the binding of gp120 to the CD4 receptor but inhibits the infection of target cells by HIV-1 and the fusion inhibitor is selected from the group consisting of pentafuside and its functionally equivalent peptides.
6. The method of claim 1 further comprising exposing target cells to the attachment inhibitors and fusion inhibitors in combination with at least one other drug selected from

the group consisting of integrase inhibitors, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and HIV protease inhibitors.

7. The method of claim 1 wherein the attachment inhibitor is an anti-HIV-1 co-receptor antibody that binds to a chemokine co-receptor selected from the group consisting of CCR5 and CXCR4 and inhibits or prevents the attachment of the co-receptor to gp120 and the fusion inhibitor is selected from the group consisting of polypeptides that interact with gp41 to inhibit or prevent its harpoon-like attachment to target cells and polypeptides that interact with gp41 to inhibit or prevent its recoil-like action that brings HIV-1 into close contact with target cells.
8. The method of claim 7 wherein the fusion inhibitor is selected from the group consisting of anti-gp41 antibodies and polypeptides having from 30 to 50 amino acids and the ability to interact with gp41 to prevent its harpoon-like or recoil-like action.
9. The method of claim 7 wherein the fusion inhibitor is selected from the group consisting of T-1249, T-649, 5-Helix, pentafuside, and their functionally equivalent peptides.
10. The method of claim 7 wherein the fusion inhibitor is selected from the group consisting of pentafuside and its functionally equivalent peptides.
11. The method of claim 7 further comprising exposing target cells to the attachment inhibitors and fusion inhibitors in combination with at least one other drug selected from the group consisting of integrase inhibitors, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and HIV protease inhibitors.
12. A method for preventing or treating acquired immunodeficiency syndrome ("AIDS") comprising administering a disease preventing or treating amount of a synergistic combination of at least one attachment inhibitor and at least one fusion inhibitor to a patient at risk for contracting or suffering from AIDS.
13. The method of claim 12 wherein the attachment inhibitor is a polypeptide selected from the group consisting of polypeptides that bind to the CD4 receptor on target cells and inhibit or prevent HIV-1 from attaching to the target cell, polypeptides that bind to the CD4 receptor on target cells and permit HIV-1 to attach to the target cell but inhibit or prevent cellular fusion between HIV-1 and the target cell, polypeptides that bind to gp120 on HIV-1 and inhibit or prevent HIV-1 from attaching to the target cells, and polypeptides that bind to gp120 on HIV-1 and permit HIV-1 to attach to the target cell but inhibit or prevent cellular fusion between HIV-1 and the target cell and the fusion inhibitor is selected from the group consisting of polypeptides that interact with gp41 to inhibit or prevent its harpoon-like attachment to target cells and polypeptides that

interact with gp41 to inhibit or prevent its recoil-like action that brings HIV-1 into close contact with target cells.

14. The method of claim 13 wherein the attachment inhibitor is selected from the group consisting of antibodies, antibody fragments, CD4 antagonists comprising a fragment of a CD4 ligand, and gp120 antagonists comprising a fragment of CD4 and the fusion inhibitor is selected from the group consisting of anti-gp41 antibodies and polypeptides having from 30 to 50 amino acids and the ability to interact with gp41 to prevent its harpoon-like or recoil-like action.
15. The method of claim 14 wherein the attachment inhibitor is selected from the group consisting of anti-CD4 antibodies and anti-gp120 antibodies and the fusion inhibitor is selected from the group consisting of T-1249, T-649, 5-Helix, pentafuside, and their functionally equivalent peptides.
16. The method of claim 13 wherein the attachment inhibitor is an anti-CD4 antibody that permits the binding of gp120 to the CD4 receptor but inhibits the infection of target cells by HIV-1 and the fusion inhibitor is selected from the group consisting of pentafuside and its functionally equivalent peptides.
17. The method of claim 12 further comprising exposing target cells to the attachment inhibitors and fusion inhibitors in combination with at least one other drug selected from the group consisting of integrase inhibitors, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and HIV protease inhibitors.
18. The method of claim 12 wherein the attachment inhibitor is an anti-HIV-1 co-receptor antibody that binds to a chemokine co-receptor selected from the group consisting of CCR5 and CXCR4 and inhibits or prevents the attachment of the co-receptor to gp120 and the fusion inhibitor is selected from the group consisting of polypeptides that interact with gp41 to inhibit or prevent its harpoon-like attachment to target cells and polypeptides that interact with gp41 to inhibit or prevent its recoil-like action that brings HIV-1 into close contact with target cells.
19. The method of claim 18 wherein the fusion inhibitor is selected from the group consisting of anti-gp41 antibodies and polypeptides having from 30 to 50 amino acids and the ability to interact with gp41 to prevent its harpoon-like or recoil-like action.
20. The method of claim 18 wherein the fusion inhibitor is selected from the group consisting of T-1249, T-649, 5-Helix, pentafuside, and their functionally equivalent peptides.

21. The method of claim 18 wherein the fusion inhibitor is selected from the group consisting of pentafuside and its functionally equivalent peptides.
22. The method of claim 18 further comprising exposing target cells to the attachment inhibitors and fusion inhibitors in combination with at least one other drug selected from the group consisting of integrase inhibitors, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and HIV protease inhibitors.
23. The method of claim 12 wherein the attachment inhibitor is administered to the patient in amounts of from about 1 to 50 milligrams per kilogram of body weight and the fusion inhibitor is administered to the patient in amounts of 0.1 to 10 milligrams per kilogram of body weight.
24. A composition for preventing infection of target cells by HIV-1 and for preventing or treating AIDS comprising at least one attachment inhibitor and at least one fusion inhibitor.
25. The composition of claim 24 wherein the attachment inhibitor is a polypeptide selected from the group consisting of polypeptides that bind to the CD4 receptor on target cells and inhibit or prevent HIV-1 from attaching to the target cell, polypeptides that bind to the CD4 receptor on target cells and permit HIV-1 to attach to the target cell but inhibit or prevent cellular fusion between HIV-1 and the target cell, polypeptides that bind to gp120 on HIV-1 and inhibit or prevent HIV-1 from attaching to the target cells, and polypeptides that bind to gp120 on HIV-1 and permit HIV-1 to attach to the target cell but inhibit or prevent cellular fusion between HIV-1 and the target cell and the fusion inhibitor is selected from the group consisting of polypeptides that interact with gp41 to inhibit or prevent its harpoon-like attachment to target cells and polypeptides that interact with gp41 to inhibit or prevent its recoil-like action that brings HIV-1 into close contact with target cells.
26. The composition of claim 25 wherein the attachment inhibitor is selected from the group consisting of antibodies, antibody fragments, CD4 antagonists comprising a fragment of a CD4 ligand, and gp120 antagonists comprising a fragment of CD4 and the fusion inhibitor is selected from the group consisting of anti-gp41 antibodies and polypeptides having from 30 to 50 amino acids and the ability to interact with gp41 to prevent its harpoon-like or recoil-like action.
27. The composition of claim 26 wherein the attachment inhibitor is selected from the group consisting of anti-CD4 antibodies and anti-gp120 antibodies and the fusion inhibitor is

- selected from the group consisting of T-1249, T-649, 5-Helix, pentafuside, and their functionally equivalent peptides.
28. The composition of claim 25 wherein the attachment inhibitor is an anti-CD4 antibody that permits the binding of gp120 to the CD4 receptor but inhibits the infection of target cells by HIV-1 and the fusion inhibitor is selected from the group consisting of pentafuside and its functionally equivalent peptides.
29. The composition of claim 24 further comprising at least one other drug selected from the group consisting of integrase inhibitors, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and HIV protease inhibitors.
30. The composition of claim 24 wherein the attachment inhibitor is an anti-HIV-1 co-receptor antibody that binds to a chemokine co-receptor selected from the group consisting of CCR5 and CXCR4 and inhibits or prevents the attachment of the co-receptor to gp120 and the fusion inhibitor is selected from the group consisting of polypeptides that interact with gp41 to inhibit or prevent its harpoon-like attachment to target cells and polypeptides that interact with gp41 to inhibit or prevent its recoil-like action that brings HIV-1 into close contact with target cells.
31. The composition of claim 30 wherein the fusion inhibitor is selected from the group consisting of anti-gp41 antibodies and polypeptides having from 30 to 50 amino acids and the ability to interact with gp41 to prevent its harpoon-like or recoil-like action.
32. The composition of claim 30 wherein the fusion inhibitor is selected from the group consisting of T-1249, T-649, 5-Helix, pentafuside, and their functionally equivalent peptides.
33. The composition of claim 30 wherein the fusion inhibitor is selected from the group consisting of pentafuside and its functionally equivalent peptides.
34. The composition of claim 30 further comprising at least one other drug selected from the group consisting of integrase inhibitors, nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors, and HIV protease inhibitors.
35. An article of manufacture in the form of a kit comprising in separate containers in a single package a combination of two or more of an attachment inhibitor and a fusion inhibitor.
36. The article of manufacture of claim 35 further comprising another drug useful for inhibiting or preventing HIV-1 infection of target cells or for the prevention or treatment of AIDS.

37. The article of manufacture of claim 36 wherein the drug is selected from the group consisting of integrase, transcriptase, or protease inhibitors.
38. The article of manufacture of claim 35 wherein the attachment inhibitor is selected from the group consisting of anti-CD4 antibodies and anti-gp120 antibodies and the fusion inhibitor is selected from the group consisting of pentafuside and its functionally equivalent peptides.
39. A means for communicating information about or instructions for synergistically using attachment inhibitors and fusion inhibitors to prevent infection of target cells by HIV-1 and to prevent or treat AIDS comprising a document or visual display that contains the information or instructions.
40. The means of claim 39 selected from the group consisting of a web site displayed on a visual monitor, brochure, and or package insert.